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ABSTRACT

This paper describes the activities of the National Institute of Education (NIE) in reading research and development with particular emphasis on the Essential Skills Program. The Essential Skills Program's purpose is to aid all children in obtaining skills necessary to function in society. The paper is divided into three categories: activities funded prior to Fiscal Year 1974, present new initiatives, and future plans. The contents include "Past History," which discusses some of the activities of NIE which were transferred from the Office of Education and the Office of Educational Opportunity, activities that originated in the Field-Initiated competition in Fiscal Year 1973, and issues suggested by the review of existing projects; "Present Activities," which looks at some of the new initiatives of the Essential Skills Program in the reading area, areas in basic research emphasized by a summer study group, and three other new activities that have also received high priority; and "The Future," which discusses the partnership that it is hoped will develop between NIE, researchers, and school practitioners. (WR)

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READING RESEARCH AND DEVELOPMENT AT THE NATIONAL INSTITUTE OF EDUCATION*

Marshall S. Smith

In early December, 1973 the National Council of Educational Research approved the formation of five priority areas for the National Institute of Education. In the planning for Fiscal Year '75 roughly 67% of the program budget is allocated to activities in the priority areas. One of the areas is called Essential Skills. The purpose of the Essential Skills area is to aid all children in obtaining skills necessary to function in society. Initial emphasis in this program area will be in the field of reading research and development.

This paper will describe the activities of the Institute in reading R&D with a particular emphasis on the Essential Skills program. I will attempt to give a broad overview -- descriptions of particular projects can be obtained by writing to us at the Institute. In order to give some historical perspective to the activities I have divided our work into three categories activities funded prior to Fiscal Year '74, present new initiatives, and future plans.

Past History

Although the Essential Skills Program itself is young, many of the activities of the Institute in reading research and development are considerably more mature. These older activities originate from two sources -- inherited OE and OEO programs initiated prior to the creation of NIE and subsequently transferred to NIE and an NIE sponsored Field Initiated Grants activity carried out in the Spring of

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1973. Taken together the two sources encompass roughly 75 separately funded projects at an overall level of near 10 million dollars.

Many of you are familiar with some of the activities of the NIE which were transferred from OE and OEO. Among the largest are the works of Labs and Centers including the Southwest Regional Laboratory, and the Wisconsin and Pittsburgh Research and Development Centers. In each of these three instances the Lab or Center has combined research and development activities over the past 5-8 years to produce new curricula in reading for the elementary grades. Much of the development work has been completed, and is now being field tested or disseminated. Other funded inherited reading-related activities in the Institute include a project through the State of California which focuses on strategies for successfully teaching reading and math in the second and fifth grades, an activity in the technology area which attempts to apply televised approaches to beginning reading, work in career education on adult literacy and work in the Experimental School Program which focuses on alternative learning environments in a variety of school systems. In a real sense the area of reading research and development cross-cuts most of the program and priority areas of the Institute.

The second set of more mature activities originated in the Field Initiated competition in FY73. In that competition some 59 projects (28% of the awards) were funded which have direct relevance to reading and language research -- activities which concentrated solely on development were ineligible. Funded projects include research in early language development, theoretical and experimental work in areas involving pre- and early reading skills, a small amount of work in reading comprehension and finally a number of research projects focusing on learning disabilities. Most of this work is presently underway in the field with the dates for final reports ranging from June, 1974 to June, 1976.

This cursory description of past NIE funded projects is intended mainly to let you know that research and development activities in reading at the Institute did not begin with the formation of the Essential Skills Program. It also serves, however, to highlight two other

issues that directly concern our work. First, as I indicated, the activities funded in reading and language are distributed throughout the Institute as a whole. Moreover, while the projects themselves were individually funded on the basis of merit -- most of them in open competition -- there was no organizing plan or framework which served to link together the projects for the purpose of systematically and thoughtfully extending the knowledge and development base in the area. And, finally, there was no substantively oriented clearinghouse for requests from the field for information about NIE's work in reading. As a consequence one of the earliest efforts of the Essential Skills Program has been to pull together into one place information about all of the reading projects, with the aim of cataloging and synthesizing it in a manner useful both for our own internal planning and for providing systematic information for the field. This work should be completed by August and a report should be available soon after.

A second issue suggested by the review of existing projects concerns the nature of the R&D process itself. Two parts of this issue are important. You will recall that I mentioned that a number of Lab and Center curriculum projects are only now reaching the field -- each after at least five years of hard work on the part of the researchers and developers in the Labs and Centers. Curriculum development from conception to implementation represents a massive investment of time and money by both the field and the funding agency -- often in the face of a great deal of uncertainty about the quality or effectiveness of the developed product. This suggests to me, particularly in the area of reading where there is a highly developed and competitive private market, that the NIE must be very careful in their consideration of new initiatives in the curriculum field and must focus on development activities that either represent an extension of a particularly promising line of research or fill a clearly needed gap in the field -- as in the development, for example, of a program for a particular and presently ignored language sub-population.

Another part of the issue regarding the R&D process itself is suggested by the somewhat ad hoc nature of prior funding by NIE in the area of reading. While there are clear debates in the research field about the efficacy of a totally directed research effort there

seems little disagreement about the need in Federal agencies to develop research and development agendas that have relatively clear goals and strategies and that attempt to systematically advance knowledge and practice. The systematic advancement of knowledge and practice require an orientation within the funding agency that transcends assessing each project solely on its individual merits. Our hope is to be able to create a funding strategy which adequately represents the state of the field -- in areas of great promise and uncertainty we expect to set out guidelines for field-initiated grants competitions which draw on the best ideas of field researchers and developers. And in areas where the knowledge base is strong and directions for new research and development unambiguous our intention is to sponsor competitions for NIE directed research and development activities.

Present Activities: Let us turn now to some new initiatives of the Essential Skills Program in the reading area. As you may have guessed, the last two sets of concerns regarding the nature of the R&D process weighed heavily in the formation of a preliminary agenda for our program. Specifically, the Essential Skills Program is presently putting together an integrated plan in the area of reading research for the next three to five years of Institute funding. Although we will not ignore potential curriculum development activities, our focus in the curriculum area will be on understanding existing curricula both in the context of helping to design new research activities and with the hope of understanding particularly effective and ongoing programs. Moreover we have adopted the strategy of initially focusing most of our efforts in the area of reading comprehension particularly as it now relates to the demands on students in the later grades of elementary schools. This dual focusing of effort -- on research and on the area of comprehension -- will hopefully allow us to have a substantial long term impact on the field and may well produce some important short-term benefits.

The intellectual heritage for this approach can in some ways be traced back to the Targeted Reading Research effort started and then abandoned by the Office of Education in the very early 70's.

But a more recent stimulus for the program took place last summer at an NIE sponsored conference on linguistics communication chaired by George Miller. One of the major recommendations from that conference was that:

> NIE support efforts to understand the verbal and non-verbal cognitive processes involved in acquiring reading skills and in comprehending linguistic messages. Comprehension is the purpose of reading, yet we know far too little about the verbal and non-verbal knowledge and conceptual organization needed for advanced reading comprehension. Although we have learned much about the legibility of type, patterns of eye movements, rates of information processing, and the like, these facts have not been put together in a coherent scientific theory of reading. We must learn more about the higher mental processes that control and maintain the intentional act of reading.

This recommendation combined with both formal and informal advice from a wide variety of scientists and practitioners in the reading area over the past four months cemented the idea that a general focus on the reading problems faced by children after the third grade -- particularly in times of limited funds -- is both intellectually and practicably advisable. Our advisors pointed to the often sudden drop in reading and other subject area scores obtained by urban and poor children in the fourth and fifth grades after formal reading instruction has often been replaced by the activity of "reading for meaning". They noted that some percentage of these children may not have learned to decode -- an unknown and vitally important percentage from the point of view of our planning -- and that attention should be given to better integrating formal reading instruction with the curriculum of the later elementary grades. They pointed to the problems that some children, who can decode, have in transferring this knowledge to the interpretation of word problems in mathematics, and to gaining information about science and social studies from elementary school textbooks. They cite the massive amount of research activity in the field of early reading -- in the area of insuring that children can learn word-sound correspondences -- and the relative weakness and paucity of research directed toward increasing the effectiveness of teaching reading comprehension. They argue that knowledge of cognitive processes has greatly increased over the past few years and that this knowledge and

effort should somehow be deflected into the applied area of understanding how best to teach children to comprehend different kinds of materials.

Turning these concerns into a coherent research agenda clearly presents some problems -- for in a sense the area of comprehension encompasses most of cognitive psychology. Our problem takes on somewhat less broad boundaries, however, given the notion that we wish to gain knowledge that may eventually be applied to the development of materials and strategies for instructing youngsters how to comprehend written and oral language. The programmatic strategy we have chosen for new initiation in FY74 is forward looking -- funds for new initiatives are largely being applied to planning and synthesizing knowledge in a variety of areas.

Three areas in basic research were emphasized by the summer study group and are receiving careful attention.

1) The first area surely has plagued many of us. It is the problem of assessing the comprehension "skills" of young children. We are particularly concerned about the lack of information that may normally be gained by the use of norm-referenced instruments -- instruments that seem to exist for the purpose of establishing the fact that children are different rather than for the purpose of determining how much and what children know. Most tests of comprehension are generated in the absence of a formal theory of the components and interrelationships among the components of comprehension. Many tests assume that we have solid information to confirm the use of reading skill hierarchies in assessment -- we don't. Only a few tests successfully relate the role of aural comprehension to reading comprehension. Finally the particular kinds of tests used on a wide scale basis provide us with little information about reading implements to comprehension -- for example, we do not know the incidence of decoding problems in the later grades of elementary school with any degree of accuracy. Work has been done in these areas -- more work needs to be done. A good deal of our attention has been focused on these issues.

2) The second area might be called the "Rigorous Modeling of Cognitive Processes". In the past few years, understanding how people acquire, store, process, and produce information has greatly increased. For example much basic research in this area has been accomplished with computers in an area called "artifical intelligence." Utilizing the computer to represent highly complex logical and mathematical models, Herb Simon and other scientists have been able to simulate some relatively sophisticated human problem-solving behavior. To date little of this work has directly focused on reading and language development tasks. We believe that research in reading and language development through computerized artificial intelligence methods is both necessary and timely. We realize, of course, that simulation of the behavior is not necessarily tantamount to understanding the cognitive processes. Nonetheless, we believe that an eventual understanding of ways to intervene in society will be substantially aided by systematic and principled development of models that faithfully represent and predict behavior.

3) The third area involves the study of Visual Information Processing Strategies. Here a great deal of work has been carried out over the past three or four decades under the rubric of eye movement research. However, new and unobtrusive techniques for the assessment of eye movements would give us important information about strategies that skilled and unskilled readers use in the processing of text. The detailed testing of the theoretical models of the reading process will require different experimental strategies and equipment to assess eye movements than are presently used. Additionally a number of our advisors have argued that present and somewhat recent developments which enable scientists to link physiological and neurological reactions with the movement of eyes should offer substantial information about the ways that people store and process information. Finally, on a more immmediately practical note, the summer

study group pointed to the heavy usage of strategies for assessing eye movements as a mirror to the attentional processes of children in formative research on TV programs like Sesame Street and the Electric Company. There is a need for more research on ways to make such efforts more efficient and accurate.

Three other new activities have also received high priority. The first is the Field Initiated Grants Program for Fiscal Year 1974. Unlike the grants competition in 1973, this year's awards will be focused on the five priority areas. The intent with regard to the Essential Skills area was to generate prospectuses addressing the broad area of research in reading, writing and language development. Roughly 700 prospectuses were submitted by the field and over 120 scientists were invited to submit full-blown proposals. These proposals will be reviewed by an outside panel of experts next week and the awards will be announced in June. I am confident that funding decisions will be difficult but relatively reasurring -- I am sure that we will have to choose from among a great number of highly qualified efforts.

The second activity involves the analysis of existing conventional and exemplary "reading" programs presently used in grades four through six. The notion here is threefold. First, we are concerned that no theoretical integration and analysis of these programs exists for the practitioner -- teachers and administrators interested in choosing an early elementary reading program can look at such sources as the USOE first grade reading studies or Chall's analysis of the debate over the proper approach to use in beginning reading. Similar sources do not exist for the teachers of fourth through sixth graders. Our hope is that information from the technical analysis we have requested will provide fodder for a document that will be made available to the field. Second, we need information about current practices in order to inform scientists studying comprehension. Finally, we want to make sure that there are not exemplary practices

buried somewhere in the field which deserve immediate attention and aid in dissemination.

The last activity I will mention is a large scale planning effort that will culminate in a conference planned for late August. The conference itself will involve upwards of eighty researchers and practitioners in an intense five day exercise to draw up specifications for an R&D agenda for the Institute in reading for the next three to five years. The conference will be organized into between eight and ten working groups each addressing a set of issues outlined in a series of pre-planning meetings by panel chairman -- the panel chairman also being drawn from the field. In a real sense the focus of our efforts during the entire spring is on the conference -- the reports on previously funded activities of the Institute, on assessment, artificial intelligence, visual information processing and on the state of current practice will all be available to conference participants in early August. For more details on the planning conference please visit us at the NIE booth.

The Future: All of this brings us to the future of the NIE in the area of reading research and development. My hope is that the activities of the Essential Skills Program during this spring and summer will result in a comprehensive and systematic plan for research in understanding how children learn to comprehend written and oral speech. We intend to make the agenda open and available to all in the field and trust that such action will both generate enthusiasm and a creative dialogue and partnership among the NIE, researchers and school practitioners. It is only through such an open partnership that the NIE can be both knowledgeable and responsive to the needs of the field.